Citation

Searching in high-dimensional spaces: Index structures for improving the performance of multimedia databases

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↑ ABSTRACT

During the last decade, multimedia databases have become increasingly important in many application areas such as medicine, CAD, geography, and molecular biology. An important research issue in the field of multimedia databases is the content-based retrieval of similar multimedia objects such as images, text, and videos. However, in contrast to searching data in a relational database, a content-based retrieval requires the search of similar objects as a basic functionality of the database system. Most of the approaches addressing similarity search use a so-called feature transformation that transforms important properties of the multimedia objects into high-dimensional points (feature vectors). Thus, the similarity search is transformed into a search of points in the feature space that are close to a given query point in the high-dimensional feature space. Query processing in high-dimensional spaces has therefore been a

very active research area over the last few years. A number of new index structures and algorithms have been proposed. It has been shown that the new index structures considerably improve the performance in querying large multimedia databases. Based on recent tutorials [Berchtold and Keim 1998], in this survey we provide an overview of the current state of the art in querying multimedia databases, describing the index structures and algorithms for an efficient query processing in high-dimensional spaces. We identify the problems of processing queries in high-dimensional space, and we provide an overview of the proposed approaches to overcome these problems.

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↑ INDEX TERMS

Primary Classification:
 A. General Literature
 ↳ **A.1** INTRODUCTORY AND SURVEY

Additional Classification:
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 F. Theory of Computation
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 H. Information Systems
 ↳ **H.2** DATABASE MANAGEMENT
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General Terms:
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Keywords:
Index structures, indexing high-dimensional data, multimedia databases, similarity search

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